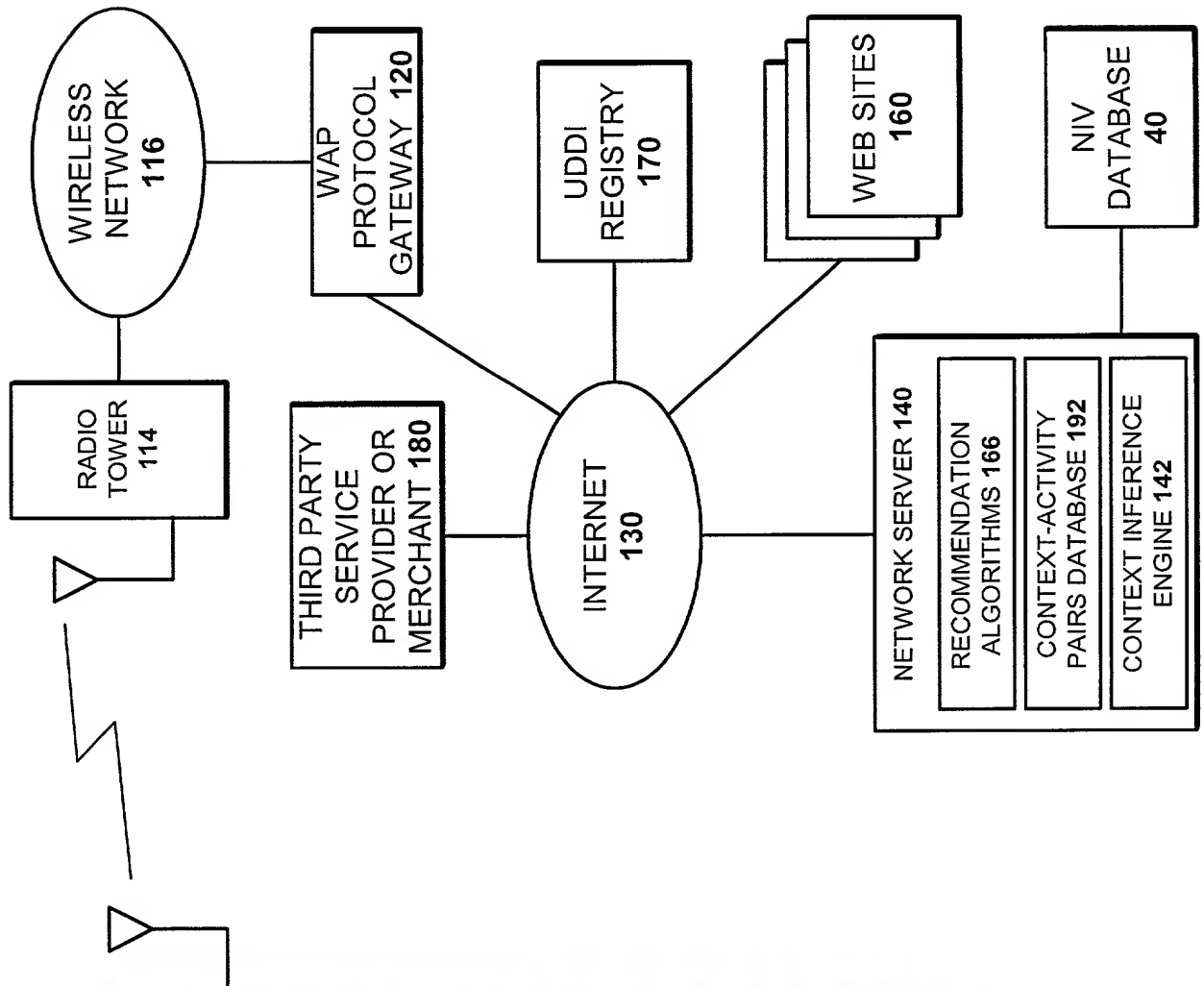
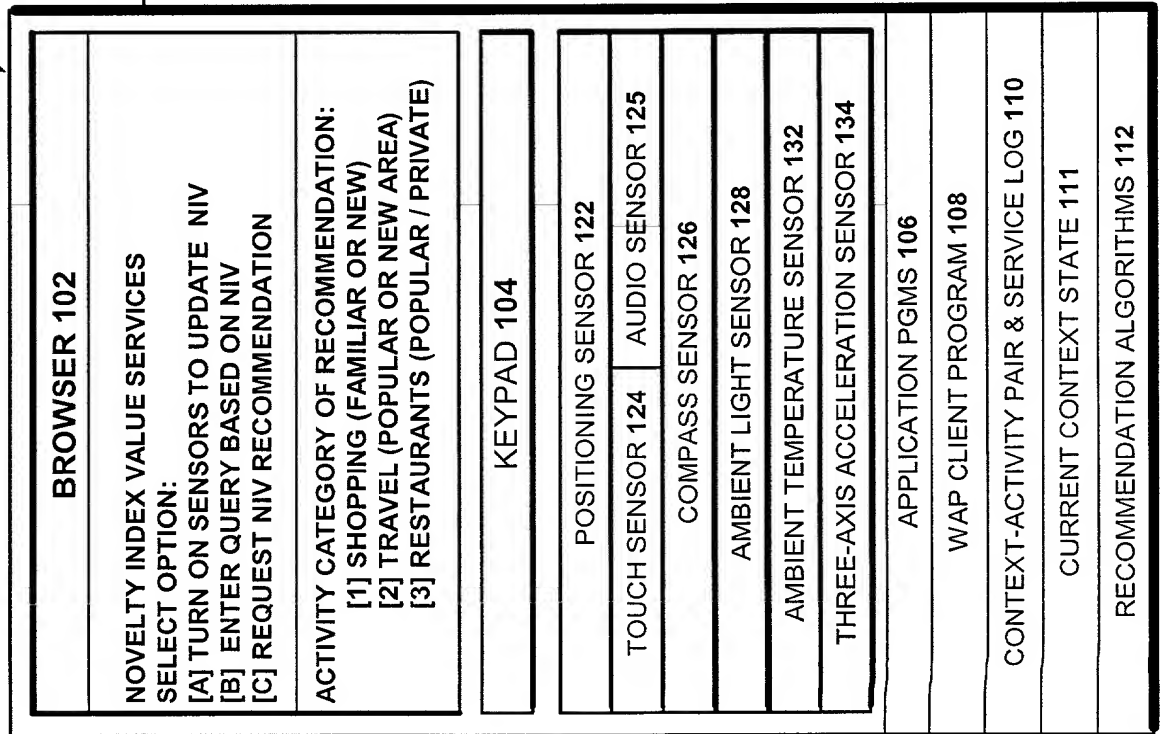
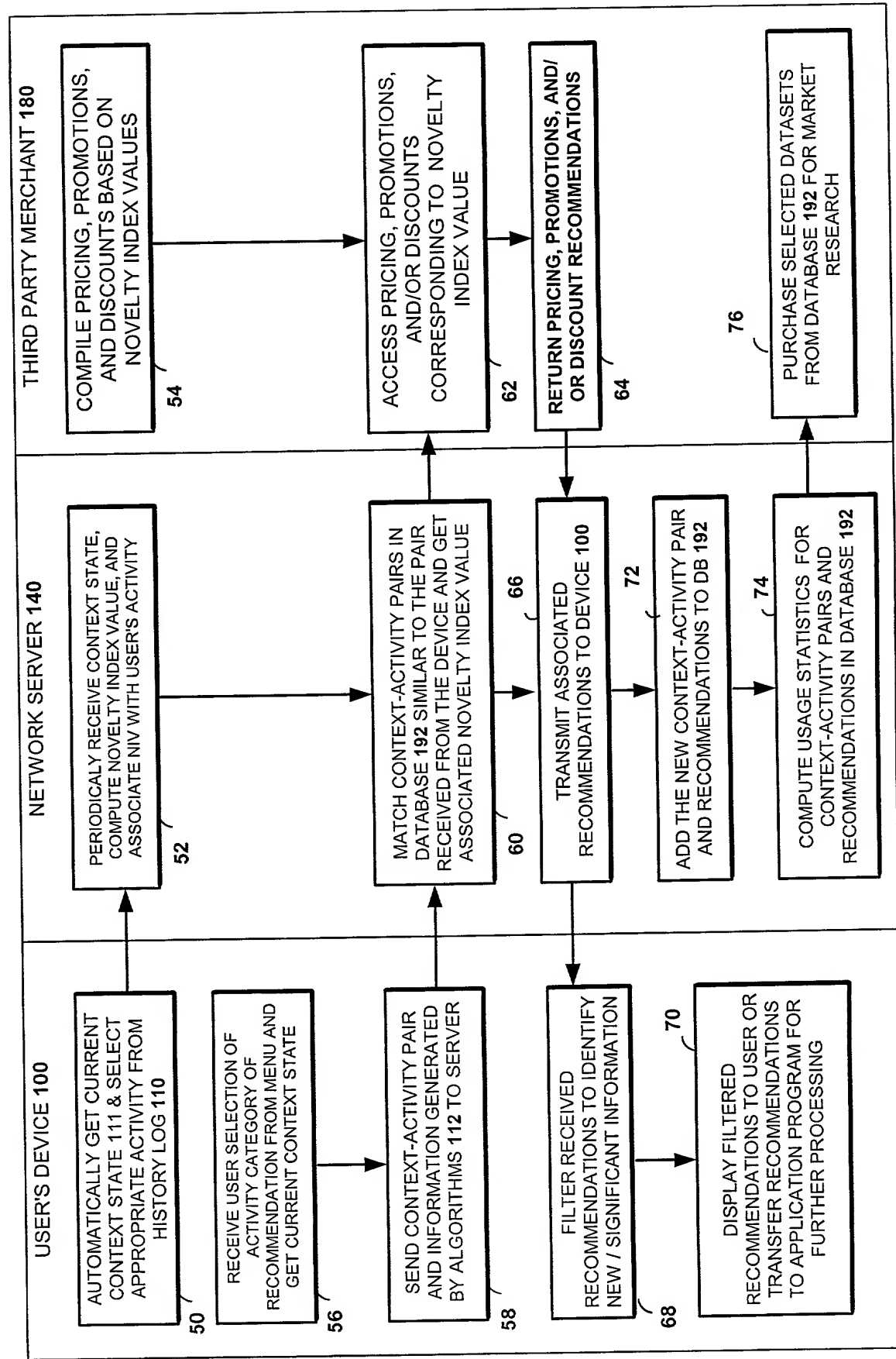


Figure 1

FIG. 1A WIRELESS DEVICE 100



NIV-DATA GATHERING AND NIV-BASED RECOMMENDATIONS



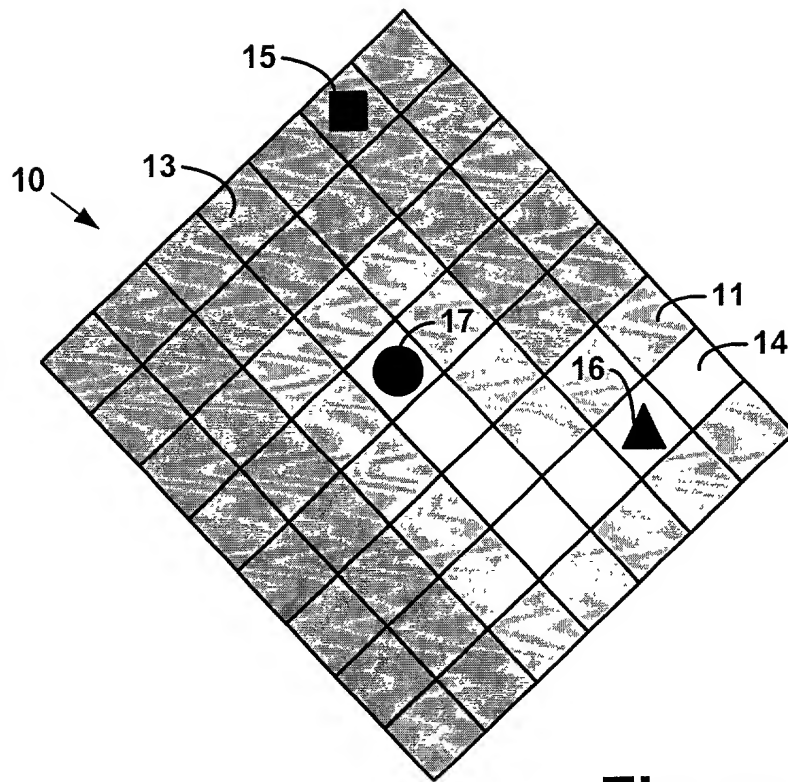


Figure 2

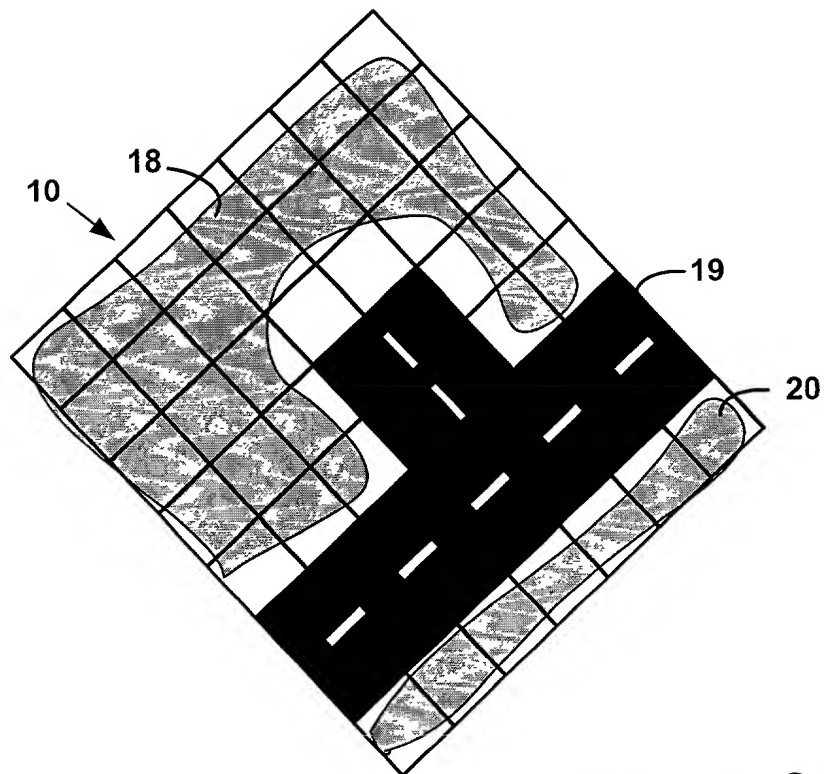


Figure 2A

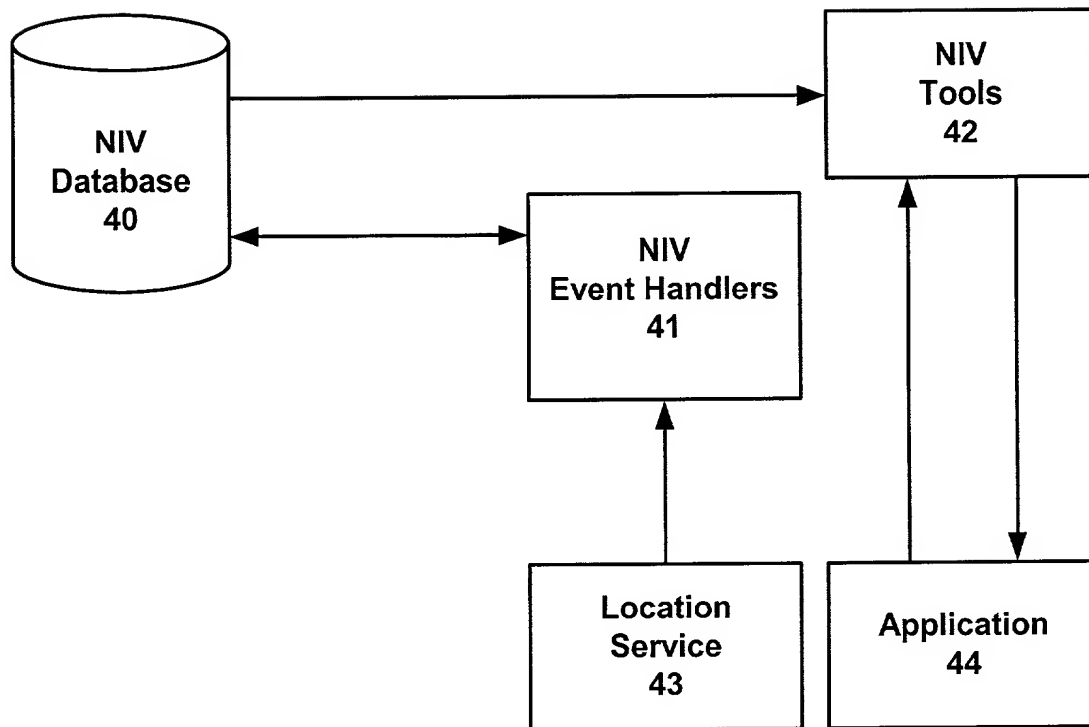


Figure 3

WIRELESS DEVICE 100

WIRELESS DEVICE 100

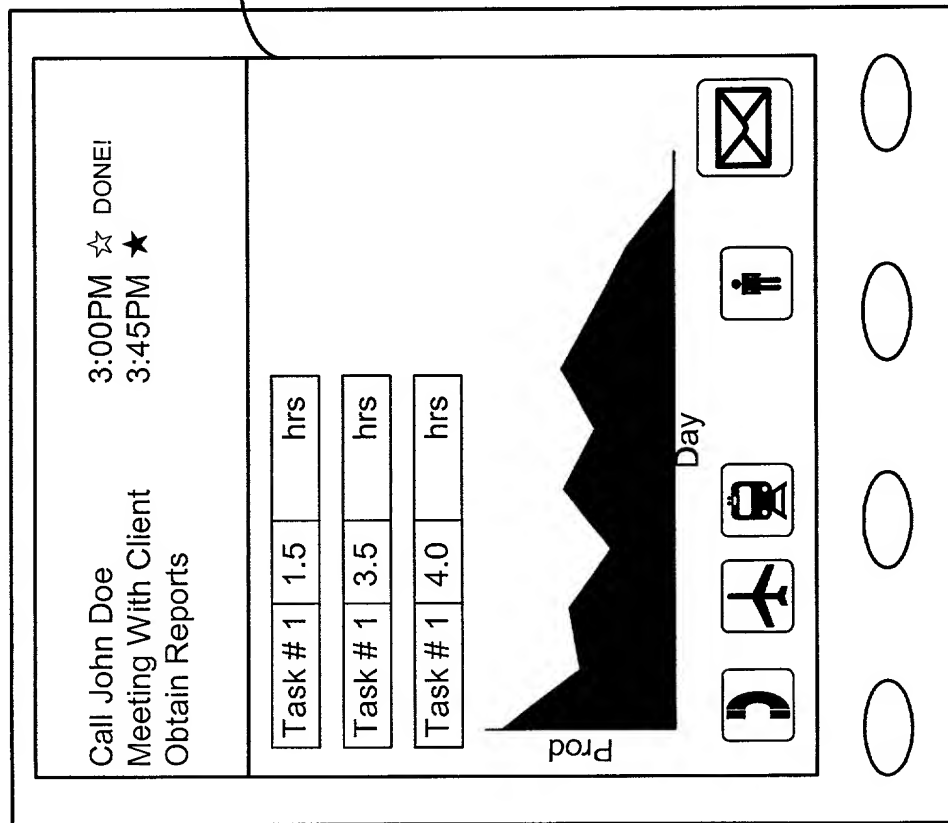


Figure 4

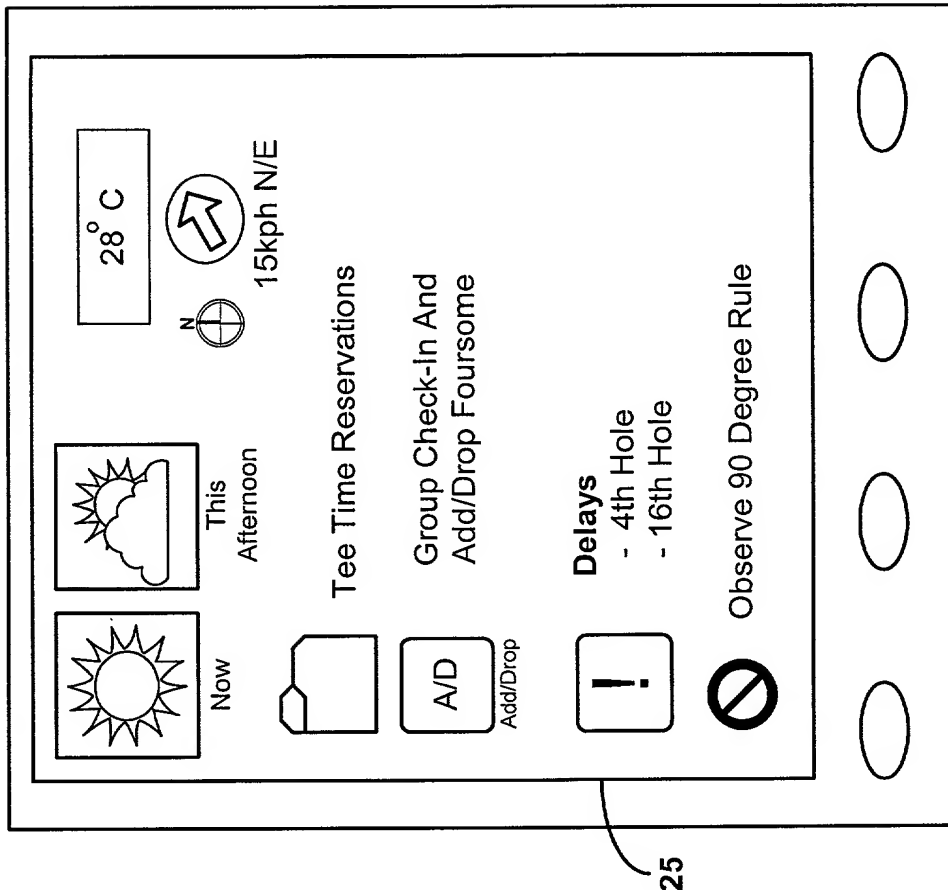


Figure 4A

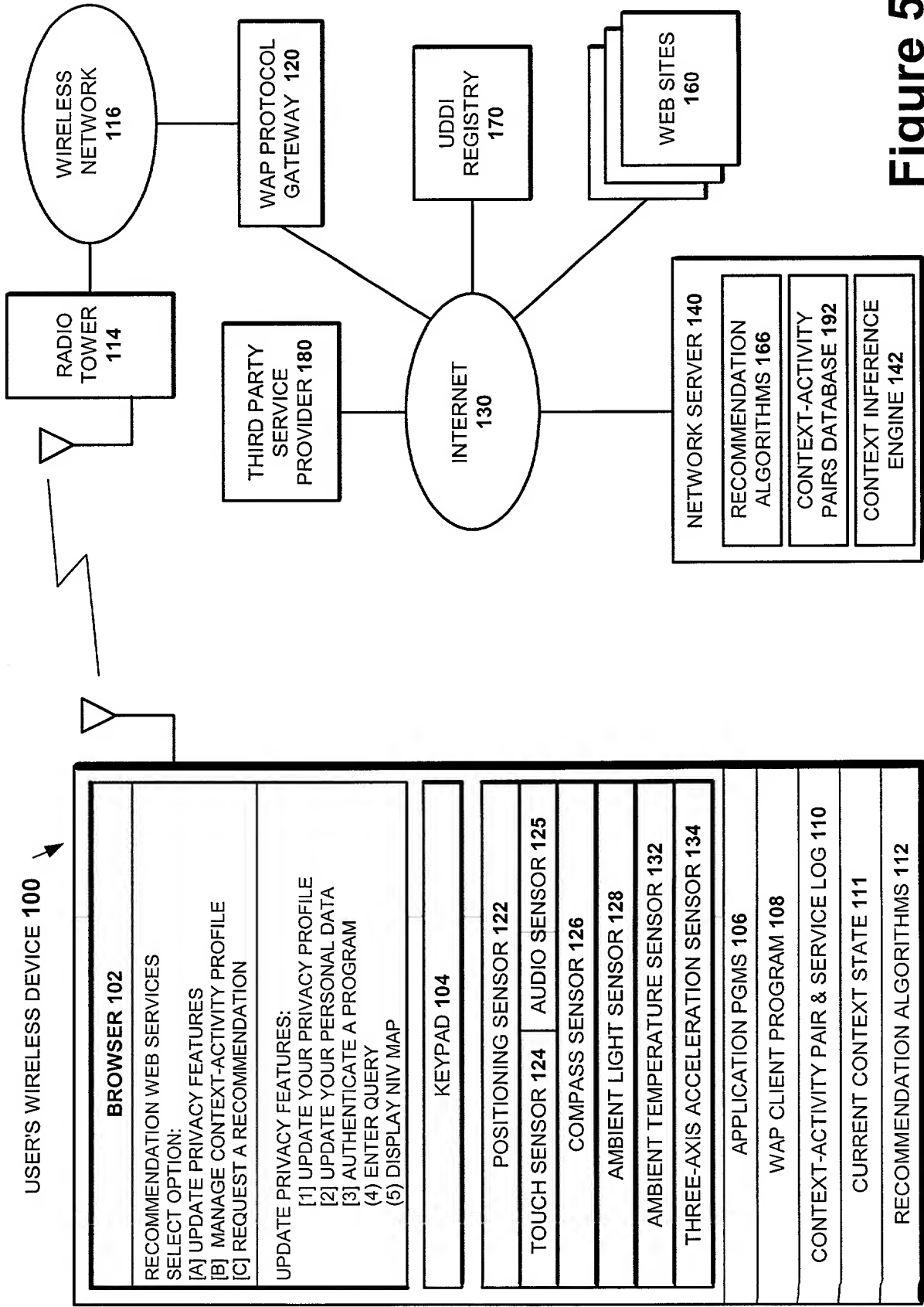


Figure 5

USER'S WIRELESS DEVICE 100

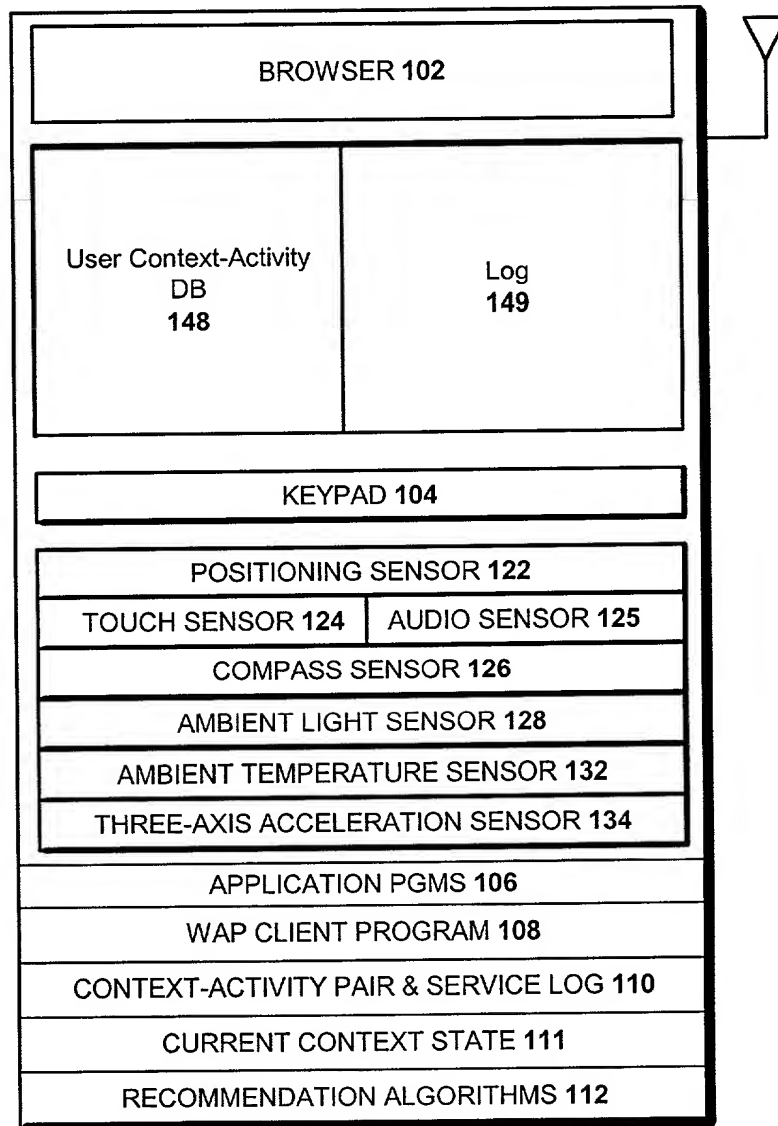


Figure 6

USER'S WIRELESS DEVICE 100

BROWSER 102
UPDATE PRIVACY FEATURES: [1] UPDATE YOUR PRIVACY PROFILE [a] Add a local program to permissions list [b] Remove a local program from list [c] Add a server program to permissions list [d] Remove a server program from list [e] Add a network program to permissions list [f] Remove a network program from list [2] UPDATE YOUR PERSONAL DATA [a] Update server database [b] Update network database
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6A

USER'S WIRELESS DEVICE 100

BROWSER 102
UPDATE PRIVACY FEATURES: [3] AUTHENTICATE A PROGRAM [a] Request program's public key certificate [b] Verify certificate signatures [c] Verify validity time [d] Verify revocation status [e] Check if certificate authority is on trust list [f] Flag program as authenticated [4] REGISTER A PROGRAM [a] When can the accesses take place [b] What data can be accessed
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6B

USER'S WIRELESS DEVICE 100

BROWSER 102
MANAGE CONTEXT-ACTIVITY PROFILE: [1] AUTOMOBILE [a] day time radio preferences [b] night time radio preferences [c] map display preferences [d] service station preferences [2] DINING [a] restaurant preferences [b] food preferences
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6C

USER'S WIRELESS DEVICE 100

BROWSER 102
MANAGE CONTEXT-ACTIVITY PROFILE: [3] ENTERTAINMENT [a] movie preferences [b] sports preferences [4] TRAVEL [a] weather forecasts [b] airline preferences [c] hotel preferences [d] car rental preferences
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6D

USER'S WIRELESS DEVICE 100

BROWSER 102
REQUEST A RECOMMENDATION: [1] AUTOMOBILE ACTIVITIES [a] request day time radio recommendation [b] request night time radio recommendation [c] request map recommendation [d] request service station recommendation [2] DINING ACTIVITIES [a] request restaurant recommendation [b] request food recommendation
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6E

USER'S WIRELESS DEVICE 100

BROWSER 102
REQUEST A RECOMMENDATION: [3] ENTERTAINMENT ACTIVITIES [a] request movie recommendation [b] request sports recommendation [4] TRAVEL ACTIVITIES [a] request weather forecasts [b] request airline recommendation [c] request hotel recommendation [d] request car rental recommendation
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6F

USER'S WIRELESS DEVICE 100

BROWSER 102
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 2001/05/08/8:00 PM LOCATION: Beale Street, Memphis, TN LIGHT LEVEL - Street Lights /Night AMBIENT TEMPERATURE - 22 C SPEED - ACCELERATION - 0 SERVICE RECOMMENDATIONS: Joe's Beef Barbecue Restaurant Elvis' Place The Blues Diner
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6G

USER'S WIRELESS DEVICE 100

BROWSER 102
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 2001/06/08/7:30 AM LOCATION: Beale Street, Memphis, TN LIGHT LEVEL - Daylight AMBIENT TEMPERATURE - 16 C SPEED - ACCELERATION - 0 SERVICE RECOMMENDATIONS: Pancake Restaurant Great Start Diner Betty's Homestyle Breakfast
KEYPAD 104
POSITIONING SENSOR 122
TOUCH SENSOR 124
COMPASS SENSOR 126
AMBIENT LIGHT SENSOR 128
AMBIENT TEMPERATURE SENSOR 132
THREE-AXIS ACCELERATION SENSOR 134

Figure 6H

Figure 7

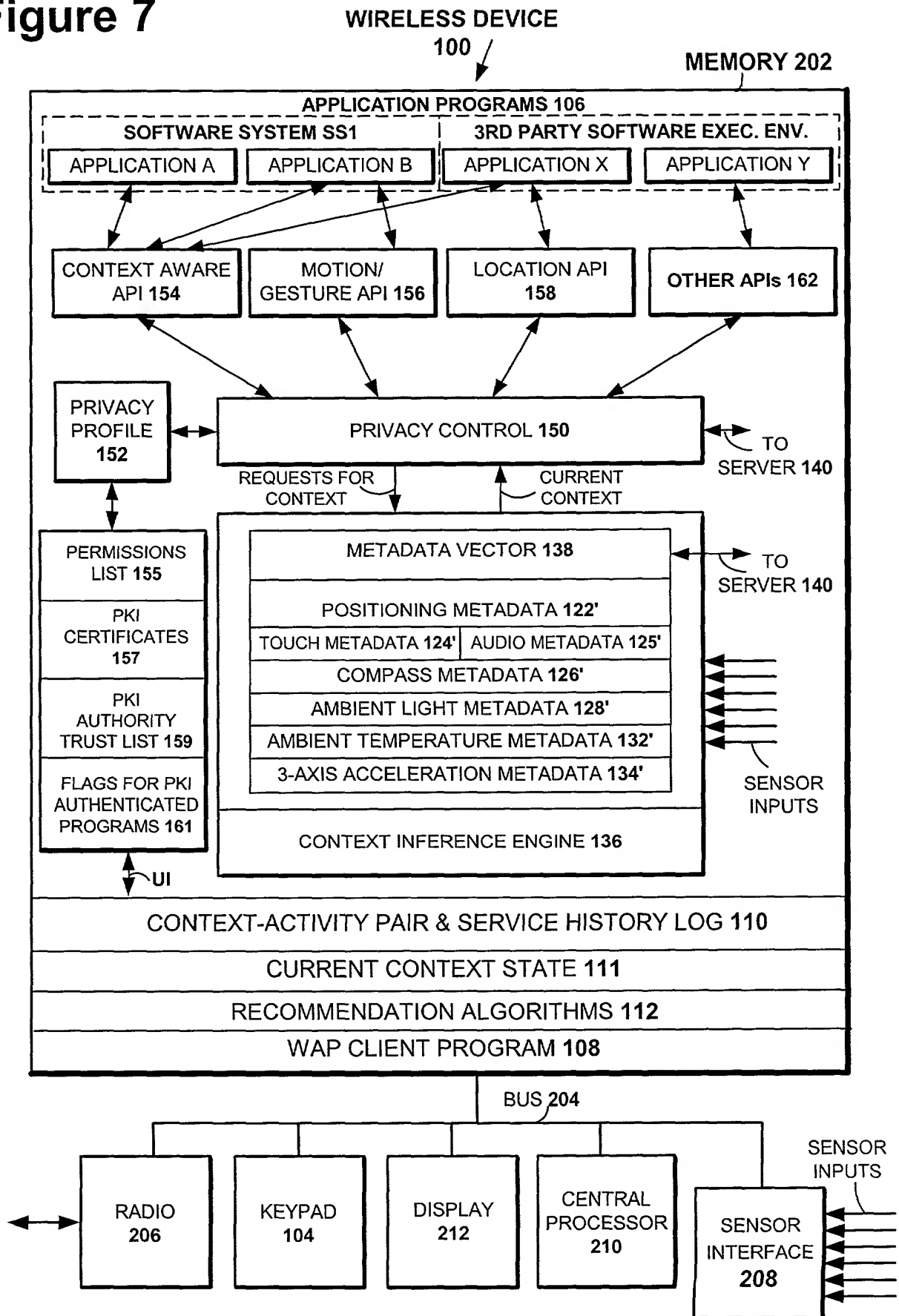


Figure 7A

USER'S WIRELESS DEVICE 100

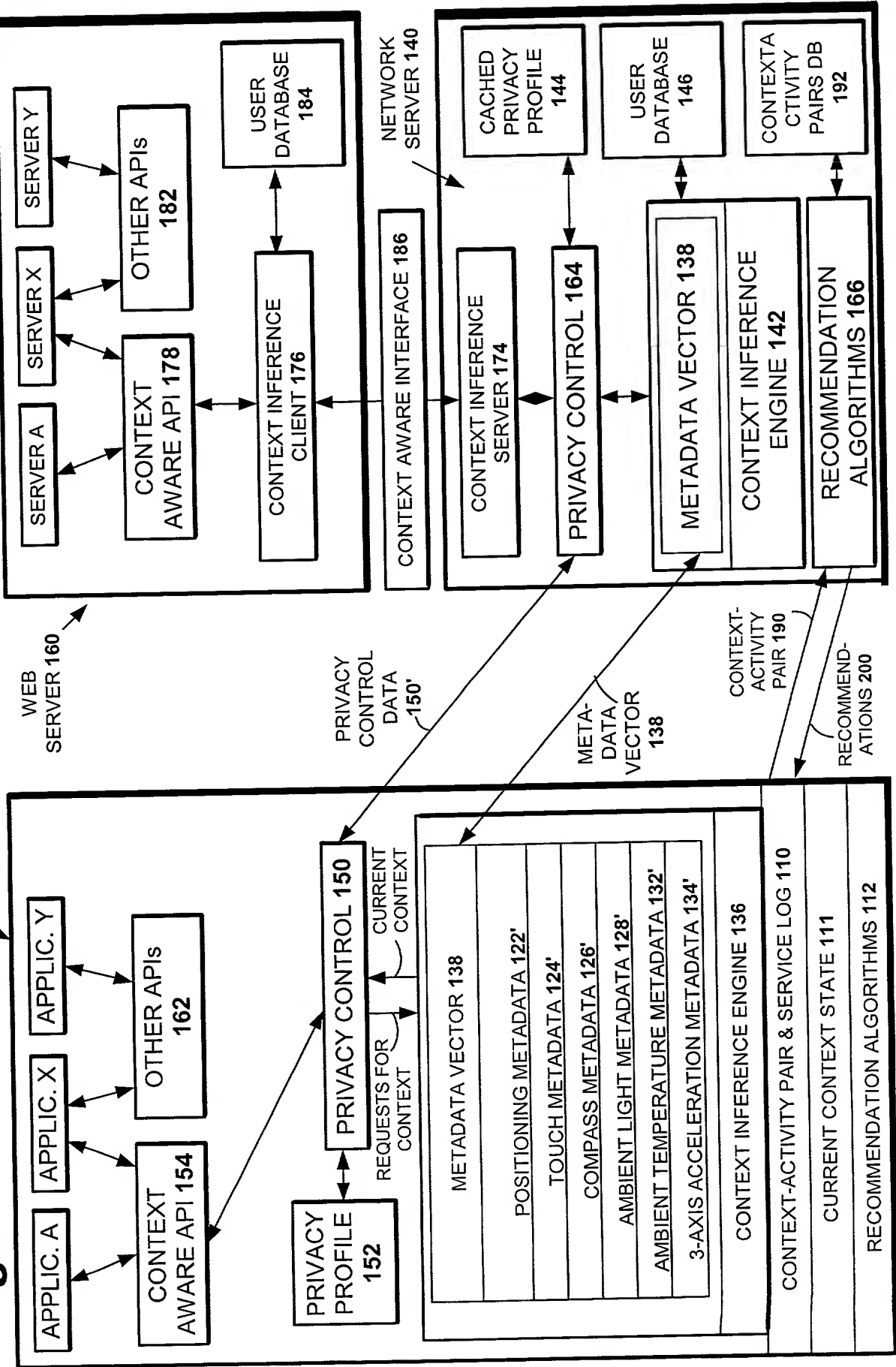


Figure 8

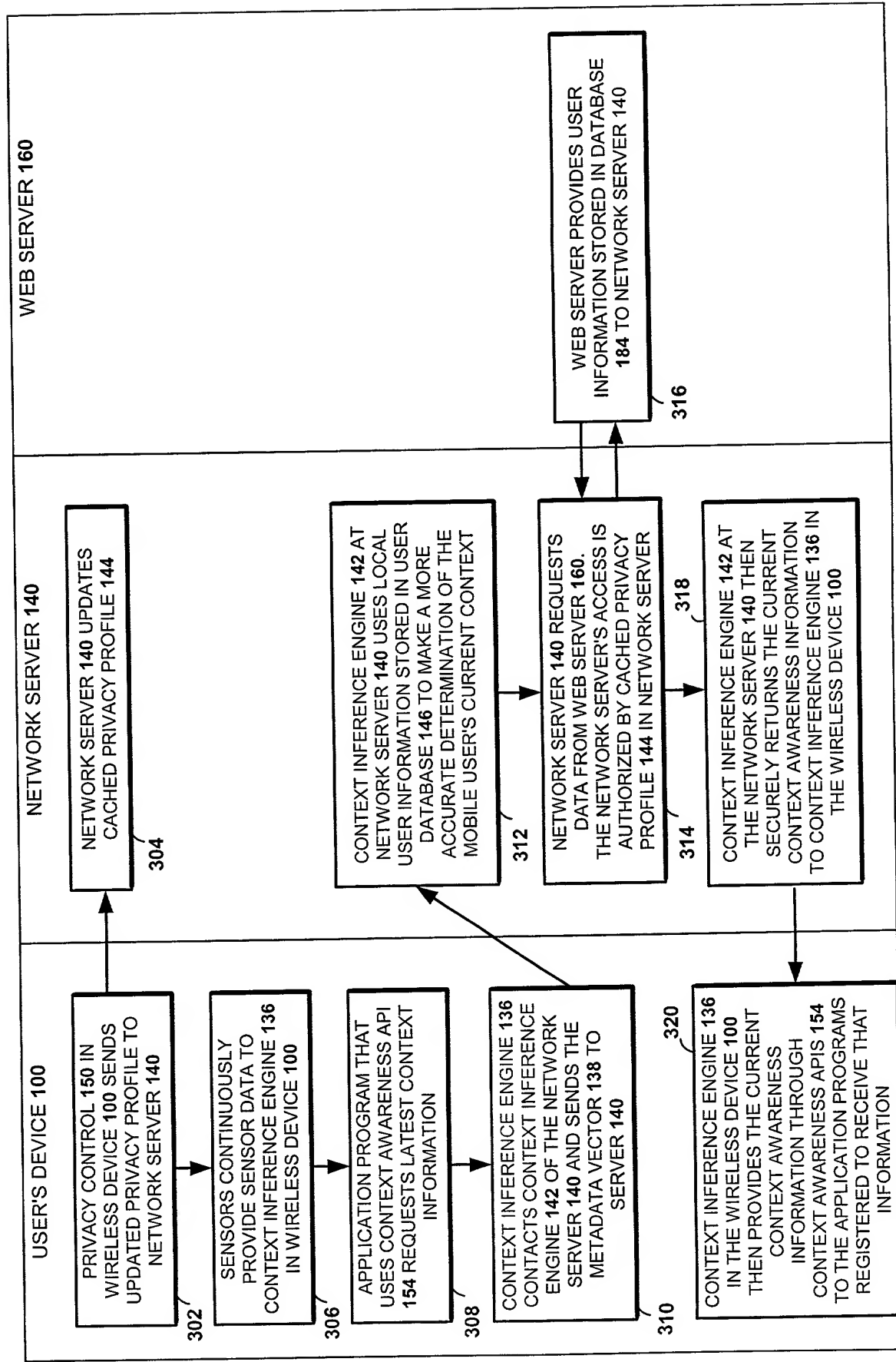


Figure 8A

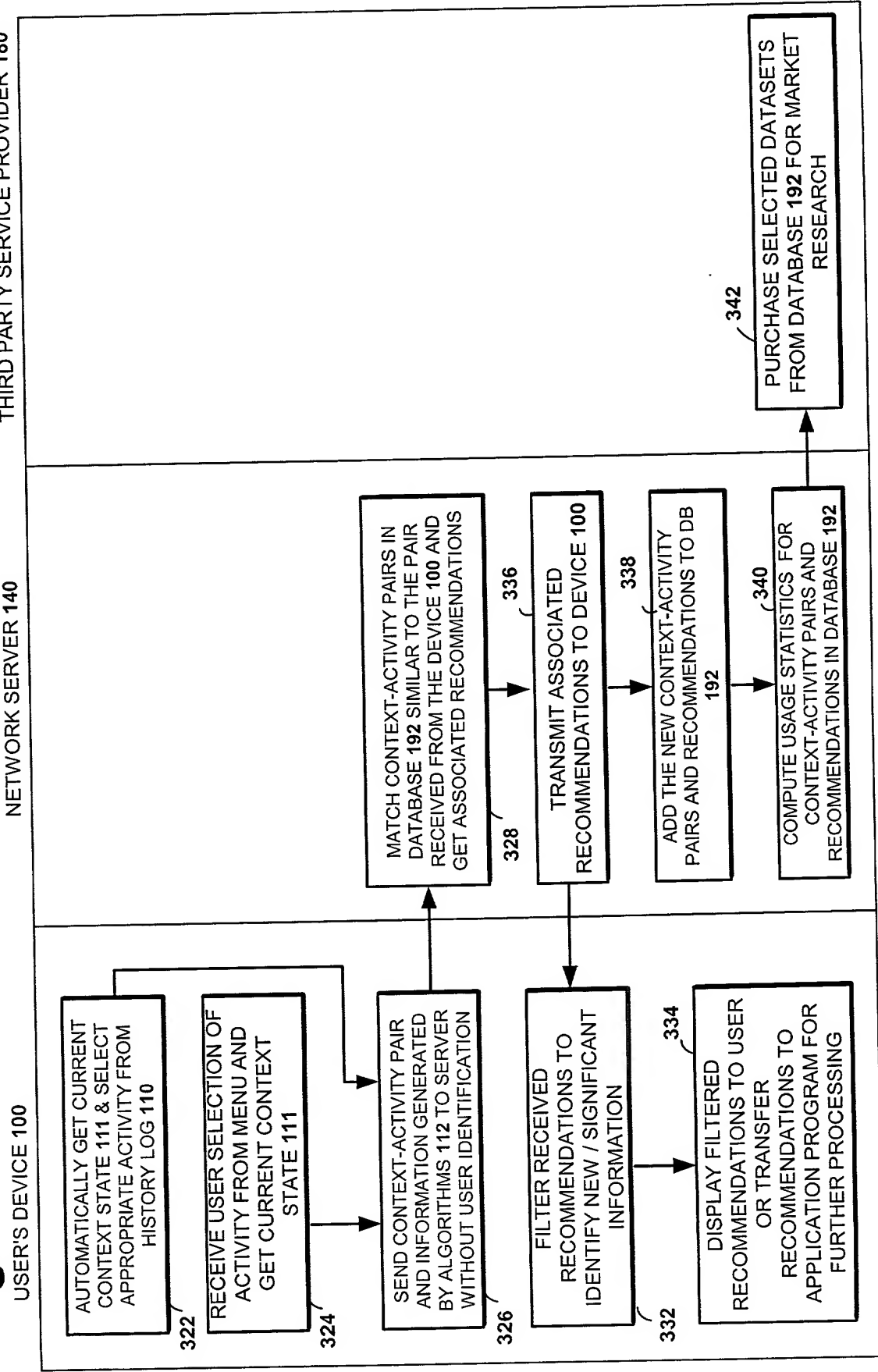


Figure 8B

CONTEXT-ACTIVITY PAIRS AND SERVICES DATABASE 192 IN SERVER 140		
CONTEXT-ACTIVITY PAIRS	SERVICE RECOMMENDATIONS	NUMBER TIMES RECOMMENDED
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 6:00 PM - 11:59 PM LOCATION: Beale St, Memphis TN LIGHT LEVEL: Night AMBIENT TEMPERATURE: 15 C - 25 C SPEED - ACCELERATION: 0 - 50 kph	Joe's Beef Barbecue Restaurant Elvis' Place The Blues Diner The Gourmet Restaurant Dan's Fast Food Restaurant	R=20 R=33 R=18 R=25 R=40
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 5:00 AM - 10:59 AM LOCATION: Beale St, Memphis TN LIGHT LEVEL: Daylight AMBIENT TEMPERATURE: 15 C - 25 C SPEED - ACCELERATION: 0 - 50 kph	Pancake Restaurant Great Start Diner Betty's Homestyle Breakfast Mike's Quick Breakfast Dan's Fast Food Restaurant	R=120 R=100 R=130 R=150 R=120

Figure 8C

CONTEXT-ACTIVITY PAIRS AND SERVICE HISTORY LOG 110 IN DEVICE 100		RECEIVE BUFFER IN DEVICE 100	
CONTEXT-ACTIVITY PAIR HISTORY	HISTORY OF SERVICES USED	RECOMMENDATIONS FROM SERVER	
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 6:00 PM - 11:59 PM LOCATION: Beale St, Memphis TN LIGHT LEVEL: Night AMBIENT TEMPERATURE: 15 C - 25 C SPEED - ACCELERATION: 0 - 50 kph	The Gourmet Restaurant [USER'S RATING = 8] Dan's Fast Food Restaurant [USER'S RATING = 6]	Joe's Beef Barbecue Restaurant R=20 Elvis' Place R=33 The Blues Diner R=18 The Gourmet Restaurant R=25 Dan's Fast Food Restaurant R=40	
ACTIVITY: DINING - restaurant CONTEXT: LOCAL TIME: 5:00 AM - 10:59 AM LOCATION: Beale St, Memphis TN LIGHT LEVEL: Daylight AMBIENT TEMPERATURE: 15 C - 25 C SPEED - ACCELERATION: 0 - 50 kph	Mike's Quick Breakfasts [USER'S RATING = 8] Dan's Fast Food Restaurant [USER'S RATING = 5]	Pancake Restaurant R=120 Great Start Diner R=100 Betty's Homestyle Breakfast R=130 Mike's Quick Breakfasts R=150 Dan's Fast Food Restaurant R=120	

Figure 8D

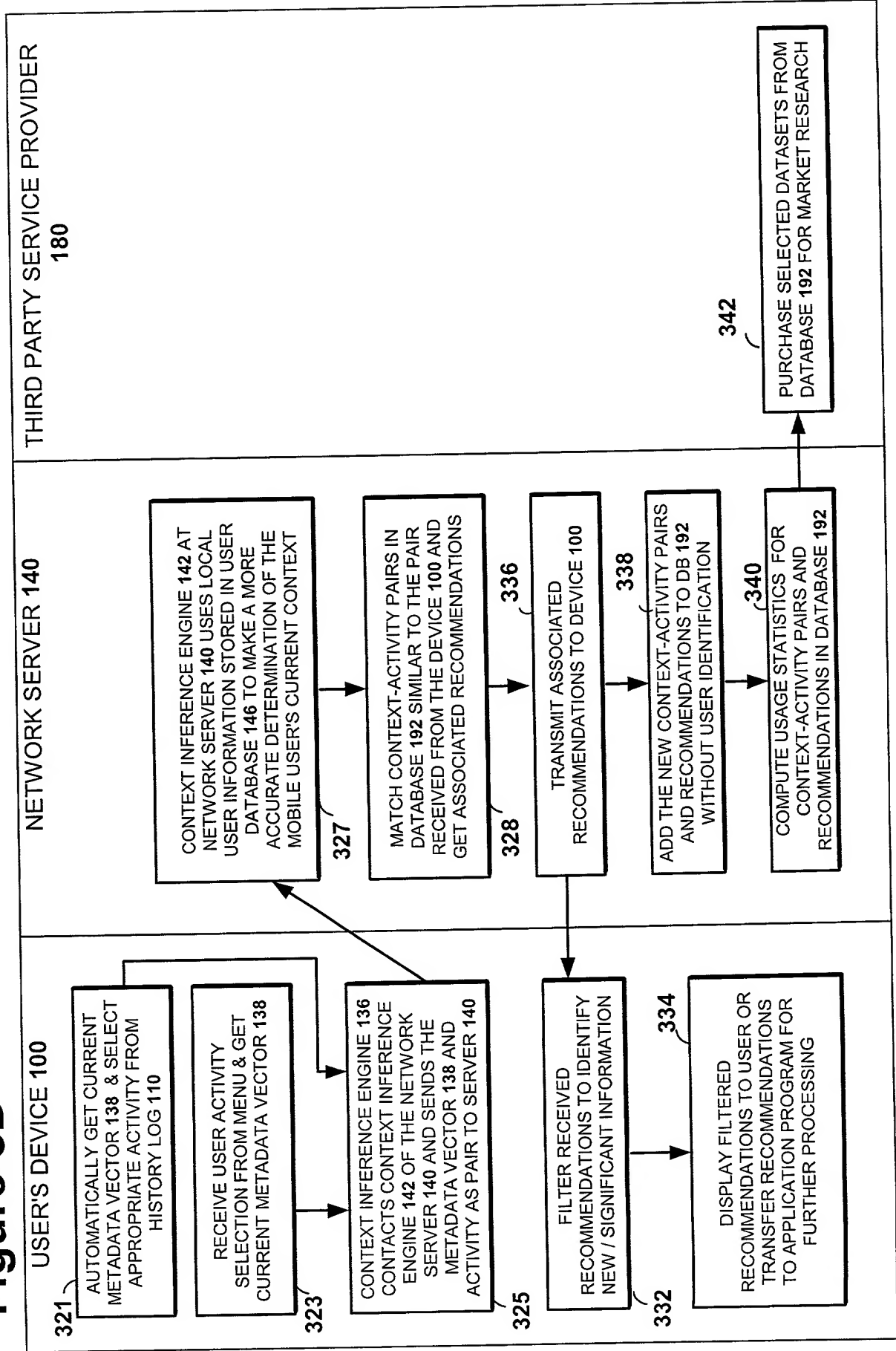


Figure 8E

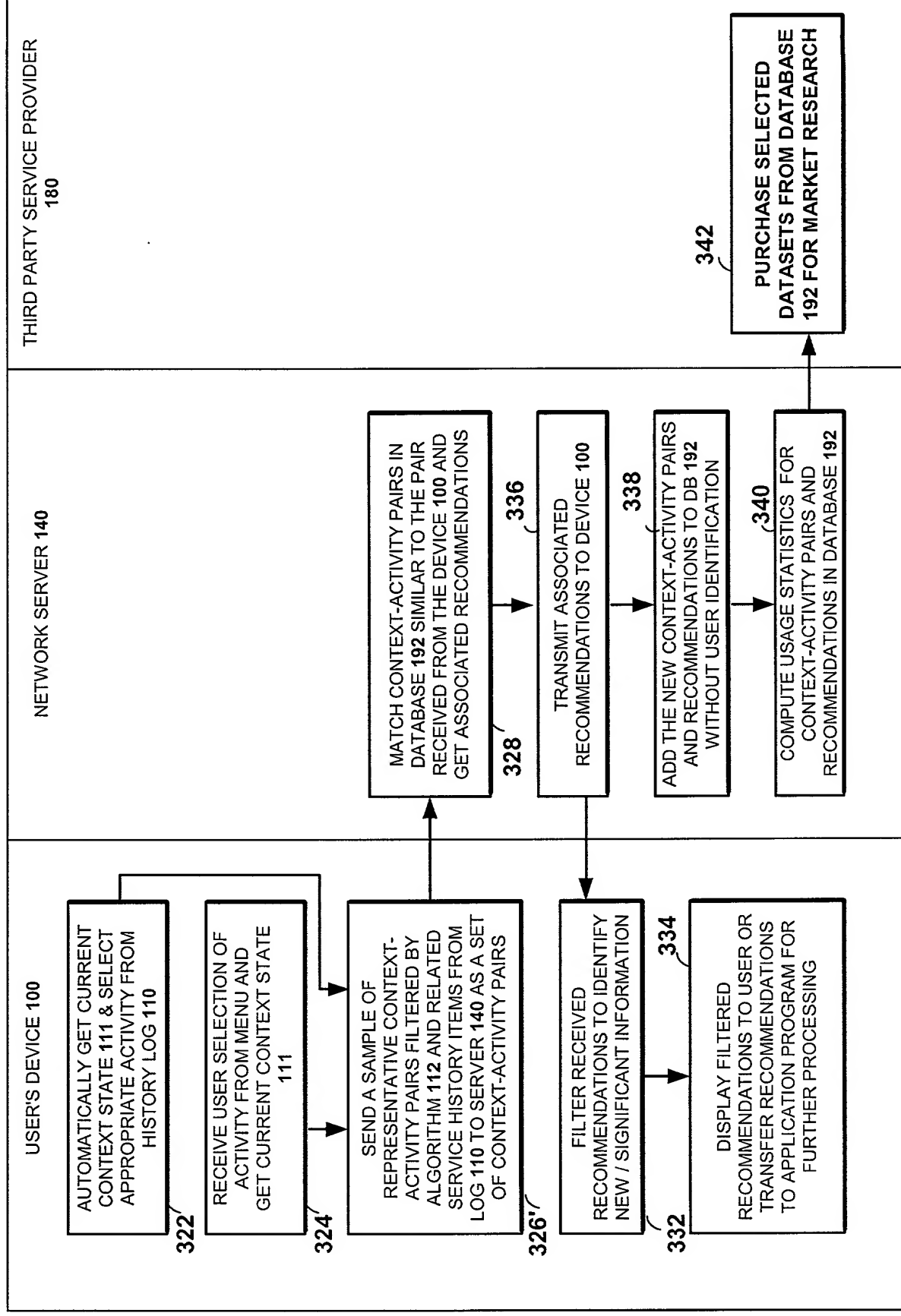
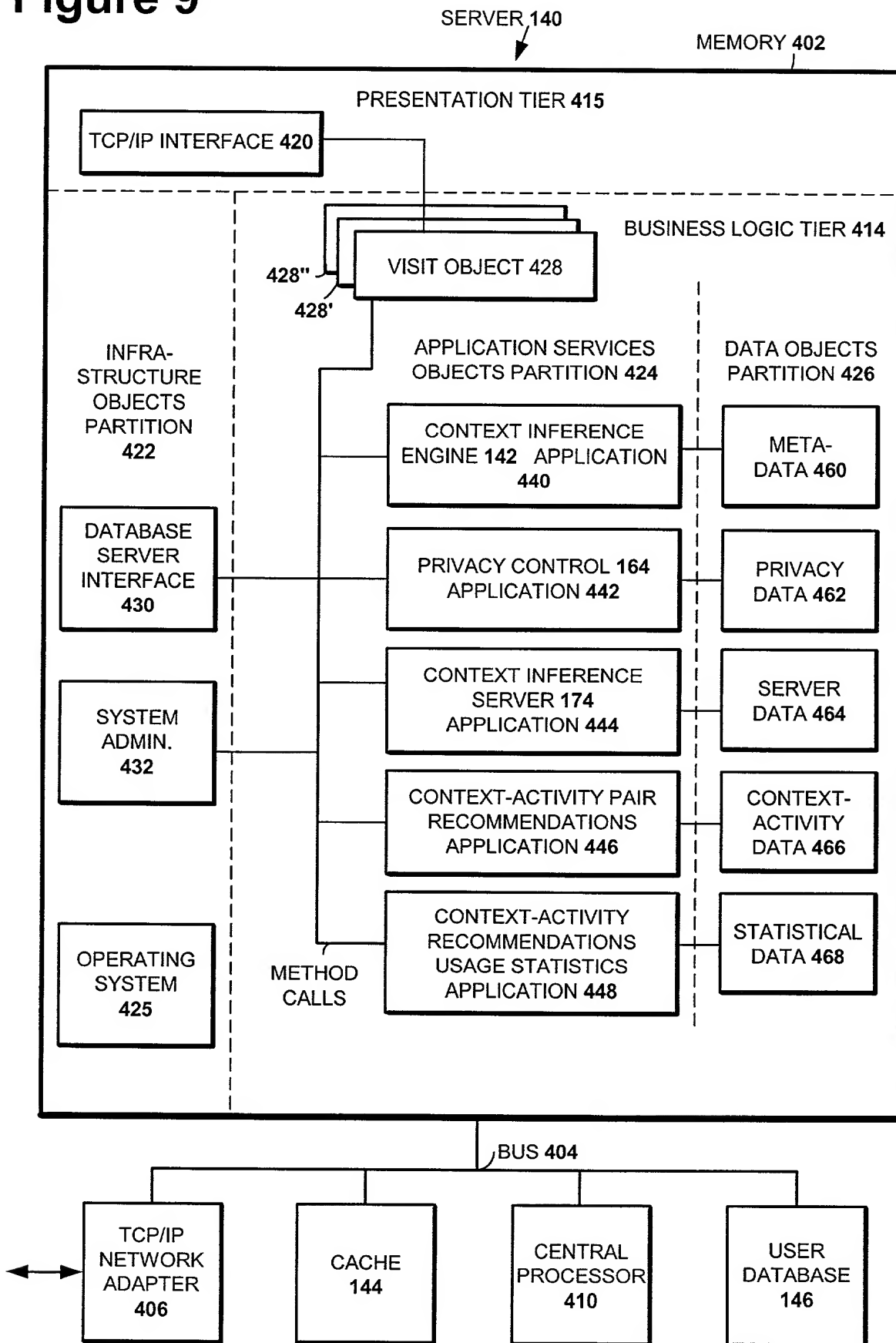


Figure 9



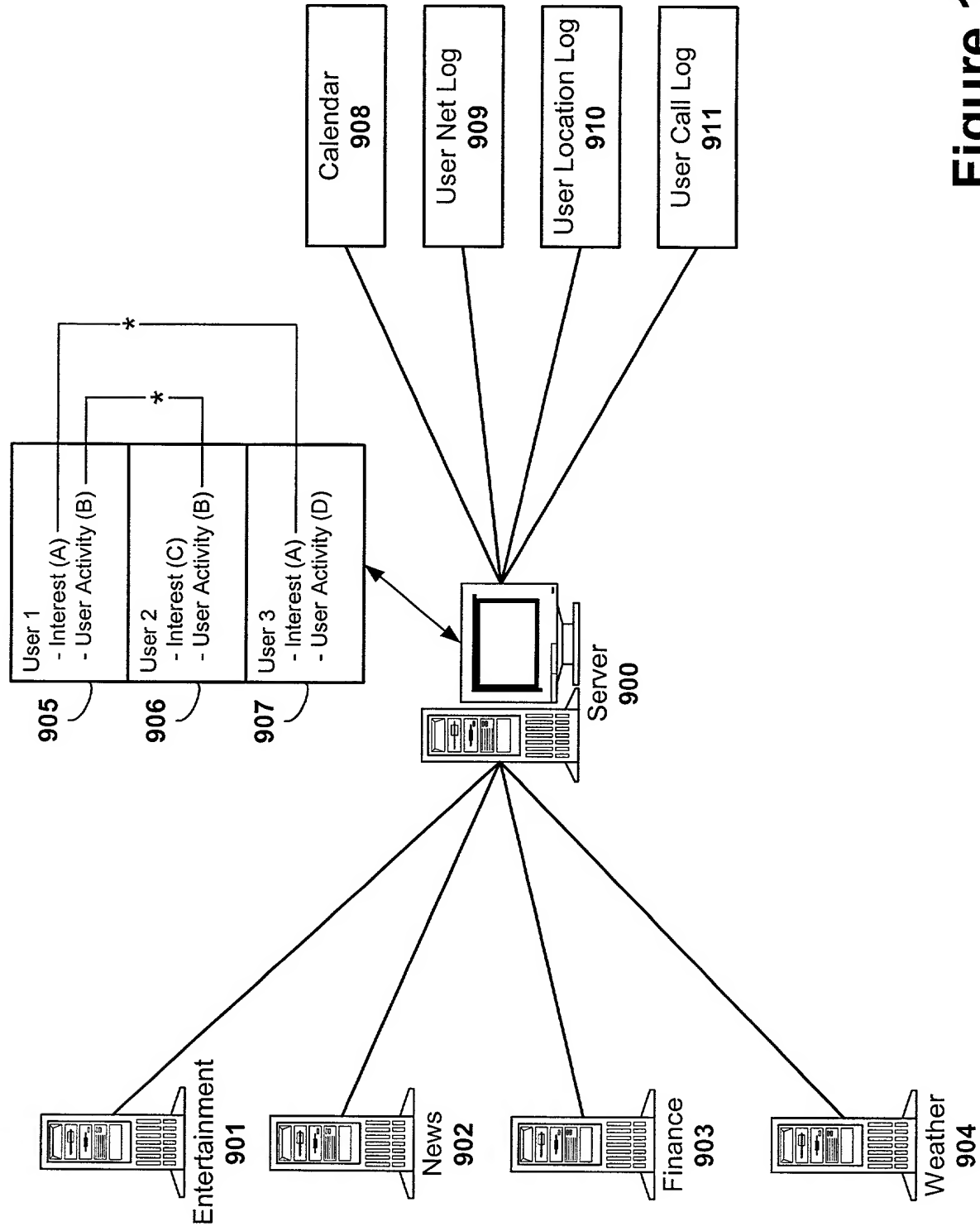


Figure 10